

**Table 1**  
**THE RELATIONSHIP BETWEEN STRUCTURAL VARIABLES AND PROCESS VARIABLES**

CITATION <sup>a</sup>	N	TYPE OF CARE	STRUCTURAL VARIABLES	PROCESS VARIABLES <sup>b</sup>	ANALYSIS	FINDING
<b>Arnett (1989)</b>	59	Centers	CG <sup>1</sup> training (1. No training, 2. 2 courses Bermuda college, 3. 4 course training prog, 4. 4-yr college degree in ECE <sup>2</sup> )	Parental Modernity Scale CIS (Positive Interaction, Punitiveness, Detachment, Permissiveness)	ANCOVA	CG <sup>1</sup> w/ half or all the Bermuda College training less authoritarian in childrearing attitudes than cg w/ no training, rated higher on positive interaction and lower on detachment in interactions w/ children. CG <sup>1</sup> w/ 4-yr ECE <sup>2</sup> degree diff from other 3 gps: childrearing attitudes less authoritarian, interact w/ children rated higher on Pos Interact and lower on Punitiveness & Detachment
<b>Berk (1985)</b>	37	Centers	CG formal education & CG specialized training	Observations of caregiver behavior	ANOVAs and correlations	College educated caregivers had more encouraging behaviors, more suggestions, less restrictive actions.
<b>Blau (in press)</b>	548 classrooms (reanalysis of CQO data)	Centers	Group size, ratio, CG experience, job tenure, ethnicity, formal education, specialized training	ECERS, ITERS	Pearson correlations, Regressions with and without a fixed effect control for center ID	Simple correlations and regressions that did not include the fixed effect center control found lower group size, lower C:A ratio, and more CG training to be related to better ECERS scores; these relations were substantially reduced when the center fixed effect control was added to the model
<b>Burchinal, Howes, &amp; Kontos (in press)</b>	Total=244 Florida Child Care Study=144 California Licensing Study=100	Family Child Care	CG <sup>1</sup> Education, Formal and Informal Training experiences, experience as a child care provider, group size, business practices Points(sum of number or children, weighted by age of children)	FDCRS, CIS	Pearson Correlations  Regression	CG <sup>1</sup> ed & experience better predictors of cc quality than C:A Ratios. CG <sup>1</sup> w/ more ed→more sensitive & rated higher on global quality. More experienced CG <sup>1</sup> slightly more detached and provide lower quality care CG w/ more education tended to have settings w/ higher global quality ratings CG experience was negatively related to observed quality in the licensed Family Child Care Study Group size or ratio not related to observed quality of care.
<b>Burchinal, Roberts, Nabors, &amp; Bryant (1996)</b>	79	Centers	Director & observer reports of group size & C:A ratio; Teacher report of training & experience	ITERS	Pearson correlations	Higher observed & reported C:A ratios were associated with lower ITERS scores Higher CG training was associated with higher ITERS scores

Table 1, continued

<b>Burchinal, et al. (in press)</b>	27	Centers	C:A Ratio <sup>3</sup> , CG <sup>1</sup> Education, Group Size	ITERS, ECERS	Pearson Correlations	Higher C:A Ratios <sup>3</sup> were related lower global quality at 12 mos, 24 mos, & 36 mos Higher group size were related to lower global quality at 24 mos & 36 mos Higher teacher education was related to higher global quality at 12 mos & at 36 mos
<b>Clarke-Stewart, et al. (2000)</b>	15 mos=133 24mos=146 36 mos=131	Child Care Homes	Group Size, Group Size Points, CG <sup>1</sup> Education, Amount of specialized training, recent training	ORCE-Positive Caregiving HOME	Correlations  HLM	Both correlational analyses & HLM analyses indicated overall quality of care measure by CC-HOME & by ratings of obs CG <sup>1</sup> behavior was higher when CG <sup>1</sup> were more highly educated, had more specialized training pertaining to children, and had received training in the past year, with the strongest effects evident at 36 mos. CG <sup>1</sup> exhibited more pos caregiving when group sizes were smaller
<b>Dunn (1993)</b>	30	Day Care Centers	CG <sup>1</sup> Education, Child Major, Training, Center Exp <sup>4</sup> , Field Exp <sup>4</sup> , CG <sup>1</sup> Age, Group Size, C:A Ratio <sup>3</sup> , ECERS	Play Space, Variety, Divergent/Elaborative Interact, Praise/ Nurturance/ Redirection, Clear Limits, Total Limits	Pearson Correlations	CG with more experience in the field and larger group sizes was positively related higher ECERS scores. Larger Group Sizes was positively related to more variety in classes. Higher ECERS scores were related to more divergent/elaborative interactions, and less total limits.
<b>Dunn et al. (1994)</b>	30	Day Care Centers	Group Size, C:A Ratio <sup>3</sup> , CG <sup>1</sup> Education, CG <sup>1</sup> Exp <sup>4</sup> in Field, CG <sup>1</sup> Exp <sup>4</sup> in Centers, CG <sup>1</sup> Certification	Lang/Reasoning (ECERS), Dev. Approp Act (ECERS), Variety, Literacy Act, Literacy Quality	Pearson Correlations Simultaneous Regression	Only one structural quality variable correlated w/ quality of environment. CG who held some form of teacher certification provided classes rated higher on literacy quality scale.
<b>Elicker, Fortner-Wood, &amp; Noppe (1999)</b>	23	Family Day Care	Group Size, C:A ratio <sup>3</sup>	Caregiver-Infant Involvement- AQS	Pearson Correlations	Smaller group size and less children per adult → more CG-Child Involvement CG yrs experience, CG educational level, income, overall work satisfaction, work-related stress, control over work sched, work & family conflict not sig corr w/ CG- Child Involvement or Infant-CG attachment

Table 1, continued

<b>Goelman (1988)</b>	74	Center Day Care Family Day Care	Caregiver Education	Learning Activities, Social Development, Language Development, Creative Activities, Total Quality	Pearson Correlations	Higher CG Education was correlated with higher total quality scores in both family day care and center day care
<b>Holloway, &amp; Reichart-Erickson (1988)</b>	15	Preschools & Day Care Centers	Group Size, C:A Ratio <sup>3</sup>	ECOI	Pearson Correlations	Smaller group sizes were related to higher ratings on the Interaction Quality Composite and accommodation of varied groups. C:A Ratio was not related to any ECOI Indicators.
<b>Howes (1983)</b>	40	Center Day Care & Family Day Care	C:A Ratio <sup>3</sup> , Group Size, # Adults, CG <sup>1</sup> years experience, training child development	CG <sup>1</sup> Beh (facilitative social, express pos affect, neg affect, restrict, responsivity)	Pearson Correlations	Caregivers in both settings w/ fewer children in their care, who worked shorter hours, w/ less housework responsibilities engaged in more facilitative social stimulation, expressed more positive affect, were more responsive, and less restrictive and negative. Family day care caregivers who worked in spaces specifically designed to be safe & appropriate for children were less restrictive of toddler activity.
<b>Howes (1997)</b>	Total=1065 Cost, Quality, Outcome Study(CQOS) =655 Florida Quality Improvement Study(FQIS)=410	Child Care Centers	C:A Ratio <sup>3</sup> , CG <sup>1</sup> Education, CG <sup>1</sup> ECE <sup>2</sup> Training	CIS, AIS	ANOVA	<b>CQOS:</b> CG <sup>1</sup> w/ BA or beyond degrees in ECE <sup>2</sup> rated more sensitive than CG w/ AA degrees in ECE <sup>2</sup> , who were more sensitive than CG <sup>1</sup> w/ other bkgds. CG <sup>1</sup> w/ at least AA degree less harsh than CG <sup>1</sup> in other bkgds. CG <sup>1</sup> in classes in compliance w/ ratio standards rated more sensitive, less harsh, & less detached. <b>FQIS:</b> CG <sup>1</sup> w/ at least BA in ECE <sup>2</sup> rated more sensitive than CG <sup>1</sup> w/ CDA training who were rated as more sensitive than all other CGs <sup>1</sup> . <b>Caregivers w/ most advanced education → most effective</b>

Table 1, continued

<b>Howes &amp; Rubenstein (1985)</b>	50 Home=23 Center Daycare=11 Family Daycare=16	Home, Center Day Care, Family Day Care	C:A Ratio <sup>3</sup> Group Size	Caregiver-Child Interaction (Talk & Play, Restrict & Cry, Touch & Laugh)	Pearson Correlations One-Way ANOVA	Lower C:A Ratio predicted quality of CG <sup>1</sup> -child interaction (i.e., social interactions-talk & play, touch & laugh, & less restrict & cry). C. at home, in high C:A ratio <sup>3</sup> FDC, & high C:A ratio <sup>3</sup> CDC-->higher Restrict & Cry than in low C:A ratio <sup>3</sup> FDC. Smaller group sizes & lower C:A ratios->higher Talk & Play & higher Touch & Laugh, less Restrict & Cry than children in larger groups & higher C:A ratios
<b>Howes &amp; Smith (1995)</b>	150	Child Care Centers	CG <sup>1</sup> char (yrs ed + specialized training in ECE <sup>2</sup> ), C:A Ratio <sup>3</sup> , Group Size	ITERS, ECERS	Pearson Correlations	Classes w/ more educated & trained teachers->higher ITERS & ECERS scores. Infant-toddler classes w/ more educated & trained teachers->smaller group size. Preschool classes w/ more educated & trained teachers->smaller group size & fewer children per adult
<b>Howes, Phillips, &amp; Whitebook (1992)</b>	143	Child Care Centers	C:A Ratio <sup>3</sup> , Group Size	Appropriate Caregiving, Developmentally Appropriate Activities	Chi-Square	Higher Child:Adult Ratios were in classrooms rated as inadequate in caregiving & rated as inadequate in activities. Children in classes w/ better ratios than children in classes w/ worse (higher)ratios experienced both caregiving & activities rated as good or very good. Large group sizes were more likely to be rated as inadequate in caregiving and inadequate in activities. However, Smaller group sizes were also rated as inadeq in activities. Children in classes w/ smaller group sizes were more likely than children in classrooms exceeding these standards to experience developmentally appropriate activities. No association between group size and appropriate caregiving.

Table 1, continued

<b>Howes, Whitebook, &amp; Phillips (1992)</b>	1300	Child Care Centers	CC <sup>5</sup> Experience, Specialized Training, Education	ECERS, ITERS, Arnett Teacher Sensitivity Measure	Pearson Correlations Multiple Regression	CG <sup>1</sup> Experience not good predictor of CG <sup>1</sup> behavior. More formal education & more specialized child-related training→CG <sup>1</sup> behaviors Formal education better predictor than specialized training. Infant/Toddler CGs <sup>1</sup> need more college-level specialized training than preschool teachers to be competent teachers.
<b>Iutovich, J., Fience, R., Johnson, J., Koppel, R., &amp; Langan, F. (1997)</b>	675 Center=561 Group Home=70 Family=44	Center, group home, family	CG <sup>1</sup> Education, CG <sup>1</sup> yrs in field, CG <sup>1</sup> salary, CG <sup>1</sup> long term ed goal, Training Characteristics, Organizational Climate	ITERS, ECERS, FDCRS	Pearson Correlations	Higher CG <sup>1</sup> Salary→higher ITERS & ECERS scores Younger CG <sup>1</sup> , CG <sup>1</sup> w/ more long term ed goals, evaluating appropriateness, and evaluate usefulness → higher FDCRS score CGs <sup>1</sup> w/ higher long term educational goals, more likely to evaluate appropriateness & usefulness→Higher FDCRS scores CG <sup>1</sup> higher ratings of Professional growth, Clarity, Reward System, Goal Consensus, & Task Orientation→Higher ECERS Scores
<b>Kontos, S., Howes, C., &amp; Galinsky, E. (1996)</b>	Training Group=130 Regulated Providers=112	Family Day Care	CG <sup>1</sup> Training, C:A Ratio <sup>3</sup> , Group Size	Process Quality: Arnett Scale of Provider Sensitivity, Adult Involvement Scale Global Quality: FDCRS	Chi-Square/t-test	The training group & the comparison group were similar on structural, process, and global quality. Providers in comparison gp cared for slightly more children per adult than training group. Effects of training→no changes in Process quality Effects of training→increased global quality in 2 of 3 sites.
<b>NICHD Early Child Care Research Network (1996)</b>	576	Center, child care homes, in-home sitters, grandparents, fathers	Group Size, C:A Ratio <sup>3</sup> , Physical Environment CG <sup>1</sup> Characteristics (formal ed, specialized training, child care experience, beliefs about childrearing)	ORCE: Caregiver Interactions	Pearson Correlations & Multiple Regression Analyses (backward elimination procedure)	Caregivers rated as providing more positive caregiving when group sizes and C:A ratios <sup>3</sup> were smaller & when cg held less-authoritarian beliefs about child rearing. Small group sizes, low C:A ratios <sup>3</sup> , CG <sup>1</sup> nonauthoritarian child-rearing beliefs, and safe, clean & stimulating physical environments consistently associated with positive caregiving behaviors within each of the different types of settings.

Table 1, continued

<b>NICHD Early Child Care Research Network (in press-a)</b>	612	Center, child-care homes, in-home sitters, grandparents, fathers	C:A Ratio <sup>3</sup> , Group Size, CG <sup>1</sup> Education, CG <sup>1</sup> Specialized Training, CG <sup>1</sup> Beliefs, CG <sup>1</sup> Experience	ORCE (Positive caregiving frequency, Positive caregiving quality) Global quality rating	Pearson Correlations & Simultaneous Multiple Regression	Across all 3 ages (15, 24, & 36 mos) & types of care, smaller group sizes, lower C:A ratios <sup>3</sup> , CG <sup>1</sup> had higher level of education, CG <sup>1</sup> held more child-centered beliefs about childrearing, & more experience in child care, and environments were safer & more stimulating→positive caregiving more likely. CG <sup>1</sup> child care exper & specialized training not correlated any ages. MR: Pos caregiving ratings sig higher when CG <sup>1</sup> had more child-centered beliefs (all ages), higher levels of ed & more experience providing care (at 24 & 36 mos), & more specialized training (15 mos), & when lower C:A ratio <sup>3</sup> & smaller gp sizes (15 & 24 mos)
<b>Phillipsen, Burchinal, Howes, &amp; Cryer (1997)</b>	749 Total 228=I/T 521=P	Child Care Centers	CG <sup>1</sup> Background (Ed Level & Exper), Class Struct (C:A Ratio <sup>3</sup> & Group Size) CG <sup>1</sup> Ed x A:C Ratio <sup>3</sup> , lead CG <sup>1</sup> wages, center struct, direct bkgd, econ char center, state, & sector	ITERS, ECERS, TIS, CIS	MANOVA Hierarchical Regressions	Structural measures predicted process quality more strongly in preschool than infant/toddler classes. Infant/Toddler: process qual higher in classes w/ mod exper & better pd teachers, & more experienced directors. Preschool: process quality higher in classes w/ CG <sup>1</sup> w/ more education, moderate amount experience, & higher wages. Better C:A ratios <sup>3</sup> , lower center enrollment, & lower proportion of Infant/Toddler & subsidized children in center also predicted higher process quality for preschool. Teacher wages strongly related to process quality in infant/toddler & preschool.
<b>Ruopp, Travers, Glantz, &amp; Coelen (1979)</b>	Natural study (n = 64) Quasi-experiment (n= 57)	Centers	C:A Ratio, group size, CG yrs education, child related training, education, physical environment	Caregiver behaviors including management, social interaction; child aimless wandering	Correlations	Smaller group sizes = more teacher-child interaction, less child aimless wandering Smaller C:A ratios = less time in child behavior management More child-related education = more teacher-child interaction,

Table 1, continued

<b>Scarr, Eisenberg, &amp; Deater-Deckard (1994)</b>	363	Child Care Centers	C:A Ratio <sup>3</sup> , Group Size, CG <sup>1</sup> Training in child dev & child care, CG <sup>1</sup> educ, highest wage pd to a CG <sup>1</sup> in the center, staff turnover	ITERS, ECERS, APECP	Pearson Correlations	Highest CG <sup>1</sup> wages was highly correlated w/ process measures of quality (ITERS/ECERS & Profile Score) Lower C:A ratios <sup>3</sup> , more teacher education, and more teacher training were correlated w/ higher process measures of quality, however, less correlated w/ process quality criteria.
<b>Stallings &amp; Porter (1980)</b>	303	Child-care homes, included sponsored, regulated, and unregulated homes	Observed C:A ratio,	Specific caregiver behaviors including teaches, plays, directs, converses, comforts, tends to physical needs, housekeeping, not involved	Pearson correlations Multiple regressions	Larger child:adult ratios associated with less caregiver teaching, playing with child, and facilitating child activities; larger child:adult ratios associated with more efforts to control child behavior. These relations were stronger when focal children were less than 35 months of age. Limited significant relations were found with caregiver education. The obtained associations indicated that less educated caregivers were more directive.
<b>Stith &amp; Davis (1984)</b>	30	Employed moms, substitute CG <sup>1</sup> unemployed moms	Group Size	Yarrow, Rubenstein & Pedersen's (1975) infant environment observational scale	Pearson Correlations	Larger group sizes → less expression of positive affect & less contingency of responses to distress.
<b>Vandell &amp; Powers (1983)</b>	53	Center	Structural composite (C:A Ratio <sup>3</sup> & toys accessible +CG <sup>1</sup> education+space allotment per child	Positive & Negative behavior w/ adults, total adult-directed behavior	ANOVA	Better C:A Ratio <sup>3</sup> , higher CG <sup>1</sup> education, & more toy availability → more likely than children in low to moderate quality care to interact w/ adults (positive behavior, positive vocalizations, total behavior)
<b>Volling &amp; Feagans (1995)</b>	36	Center	Group size C:A ratio	Positive adult-child interaction Nonsocial activity, positive peer interaction, negative peer interaction	Pearson correlations	Smaller group sizes and C:A ratios related to children having more time in positive staff-child interactions and less time in nonsocial activities. Larger C:A ratios were related to more frequent negative interactions with peers

<sup>a</sup>Full citations available in Reference Section

<sup>b</sup>Process Quality Measure Acronyms are Alphabetized. **AIS**: Adult Involvement Scale; **APECP**: Assessment Profile for Early Childhood Programs; **AQS**: Attachment Q-Set; **CIS**: Caregiver Interaction Scale

**ECERS**: Early Childhood Environment Rating Scale; **ECOI**: Early Childhood Environment Rating Scale; **FDCRS**: Family Day Care Rating Scale; **HOME**: Home Observation for Measurement of the Environment **ITERS**: Infant/Toddler Environment Rating Scale; **ORCE**: Observational Record of the Caregiving Environment; **TIS**: Teacher Involvement Scale

Table 1, continued

<sup>1</sup>CG=Caregiver <sup>2</sup>ECE=Early Childhood Education <sup>3</sup>C:A Ratio: Child:Adult Ratio <sup>4</sup>Exp: Experience <sup>5</sup>CC: Child Care